

West Point N. Y. Feb. 7, 1856

My dear friend

Can you send some bits of plants which are noted for the silica in their cuticle. Sir David Brewster some 20 years ago published a statement that the silica in Equisetaceae ^{and some other plants} was doubly-refractive, and polarised light beautifully - This has been copied over and over again, and in Cressett on the Microscopu directions are given for preparing Equisetum hyemale for examination by polarised light - Some recent experiments which I have made on the cuticle of Equisetum leave not a shadow of doubt that Brewster was wrong - The silica in Equisetum and in the common rattan does not affect polarised light in the slightest degree - The error has arisen from portions of the carbonaceous tissues being left in that was supposed to be pure silica - A new process I have invented for removing the carbon, takes out every trace of it, and polarising specimens, ^{of Equisetum} put up in London, were found by this process to retain a large portion of the carbonaceous tissues, ~~after~~ after the removal of which, the silica retained the form as before

and ~~was~~ ^{was} still as transparent as glass, ^{yet} showed no
action ~~and~~ polarized light -

I wish to pursue this investigation so as to confirm or disprove
my present belief that such a thing as crystalline, or
doubly refractive silica does not exist in the vegetable
kingdom - If you can send me some bits of such things
I will mount some of the results for you, and send
them by my son when he returns - I have already some
beautiful preparations of the Equisetum for you, showing
the stromata finely - Quekett mentions the palae
botanists of Festuca pratensis as exhibiting a beautiful
arrangement of silica - I would like a lot of it, also of
any Cane, Bamboo, or other grass with hard cuticle.

Please send also a leaf of Dactyloctenium. Pieces of the plant
an inch long will answer all my purposes and can
be sent in a letter -

If you happen to have seen any contradiction of Brewster's
statement please let me know.

My son Leving is with me, amusing himself in
vacation with helping me, ^{and his younger brother} to slide down hill, and
I am helping him in ^{the} study of Descriptive Geometry
which he voluntarily commenced as a pastime during

his vacation -

Don't let my requests interrupt your labours, but some
time when you are least busy send me a few fragments

Yours ever cordially
J. W. Bailey

Prof. Asa Gray
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